Fig.1A

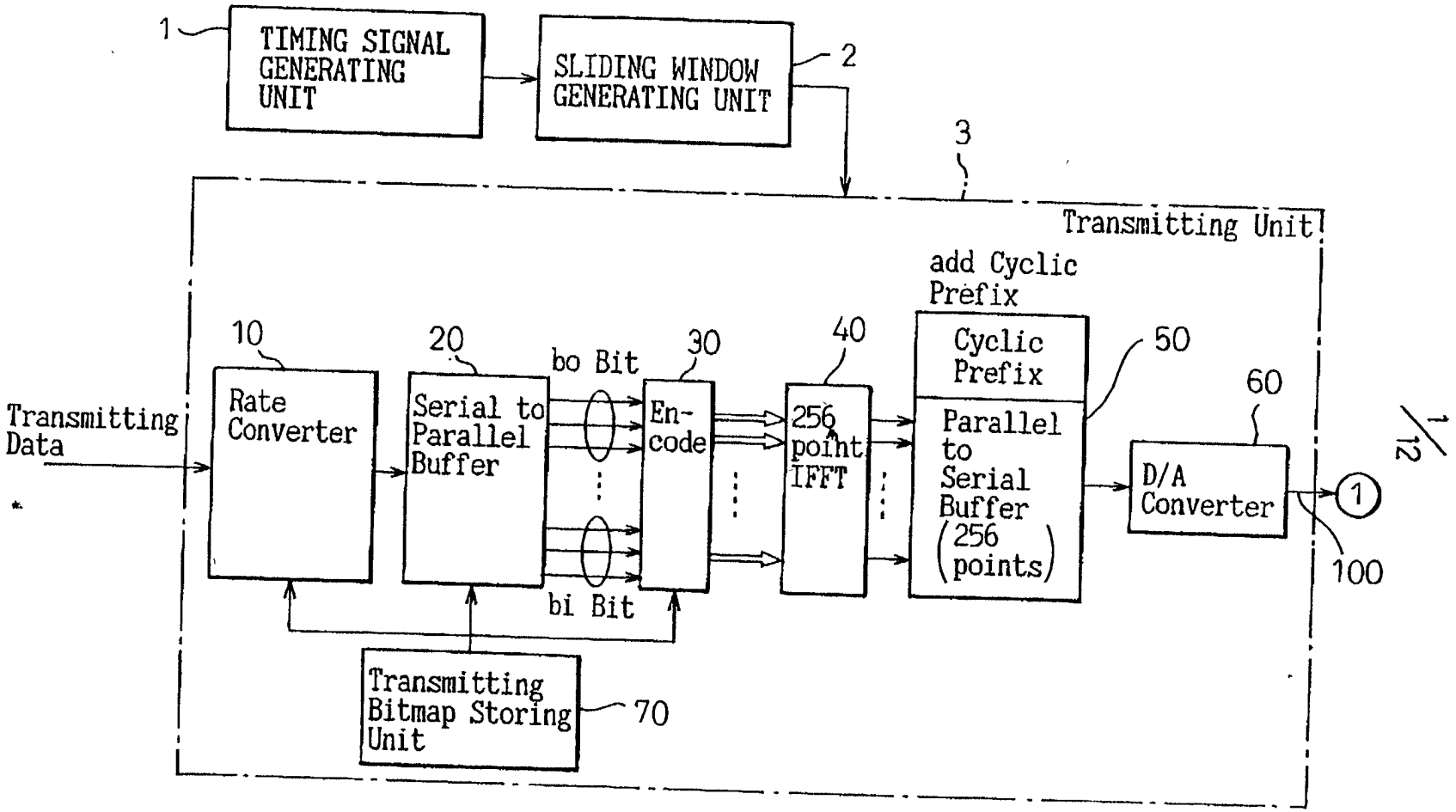

1
TIMING SIGNAL GENERATING UNIT
SLIDING WINDOW GENERATING UNIT
2
3
Transmitting Unit
add Cyclic Prefix
10
20
bo Bit
30
40
Cyclic Prefix
50
60
Transmitting Data
Rate Converter
Serial to Parallel Buffer
En-code
256 point IFFT
Parallel to Serial Buffer (256 points)
D/A Converter
1
100
bi Bit
Transmitting Bitmap Storing Unit
70
1/12

Fig.1B

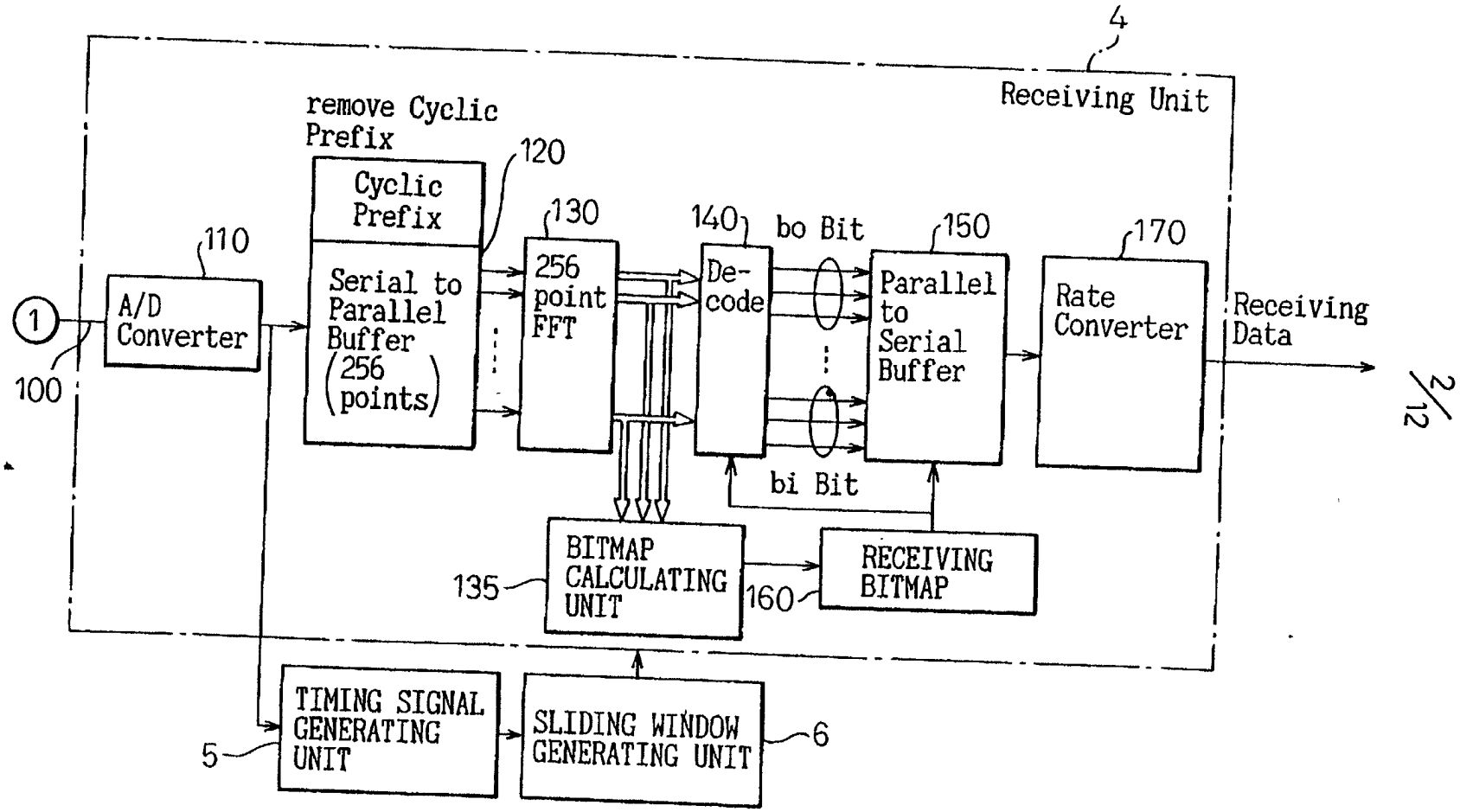

4
Receiving Unit
remove Cyclic Prefix
120
Cyclic Prefix
130
140
bo Bit
150
170
110
A/D Converter
Serial to Parallel Buffer (256 points)
256 point FFT
De-code
Parallel to Serial Buffer
Rate Converter
Receiving Data
1
100
bi Bit
BITMAP CALCULATING UNIT
135
RECEIVING BITMAP
160
TIMING SIGNAL GENERATING UNIT
5
SLIDING WINDOW GENERATING UNIT
6

Fig.2

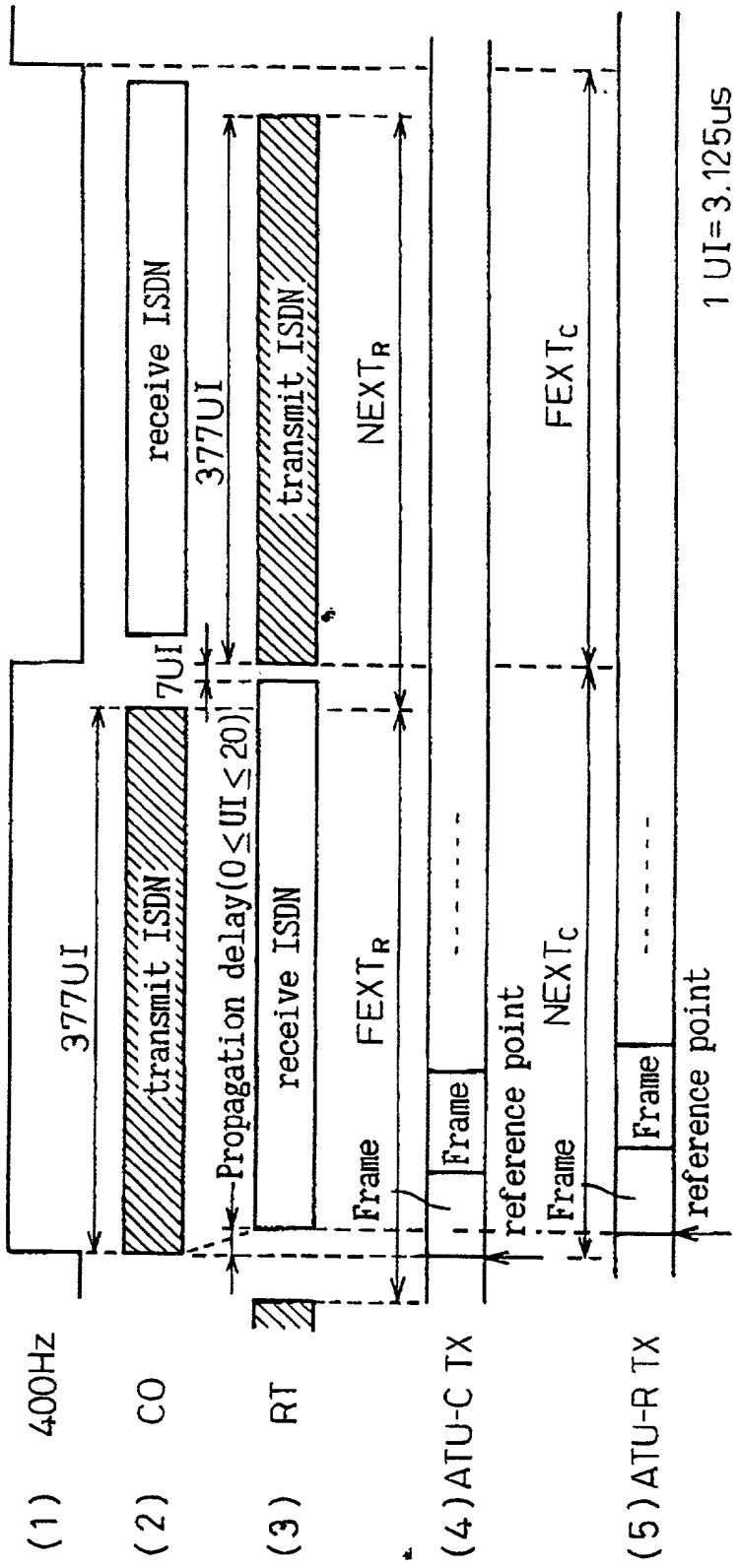

(1) 400Hz
(2) CO
(3) RT
(4) ATU-C TX
(5) ATU-R TX
377UI
transmit ISDN
7UI
receive ISDN
377UI
Propagation delay(0≤UI≤20)
receive ISDN
transmit ISDN
FEXTT_R
NEXT$_R$
Frame
Frame
reference point
NEXTT_C
FEXTT_C
Frame
Frame
reference point
1 UI=3.125us

Fig.3

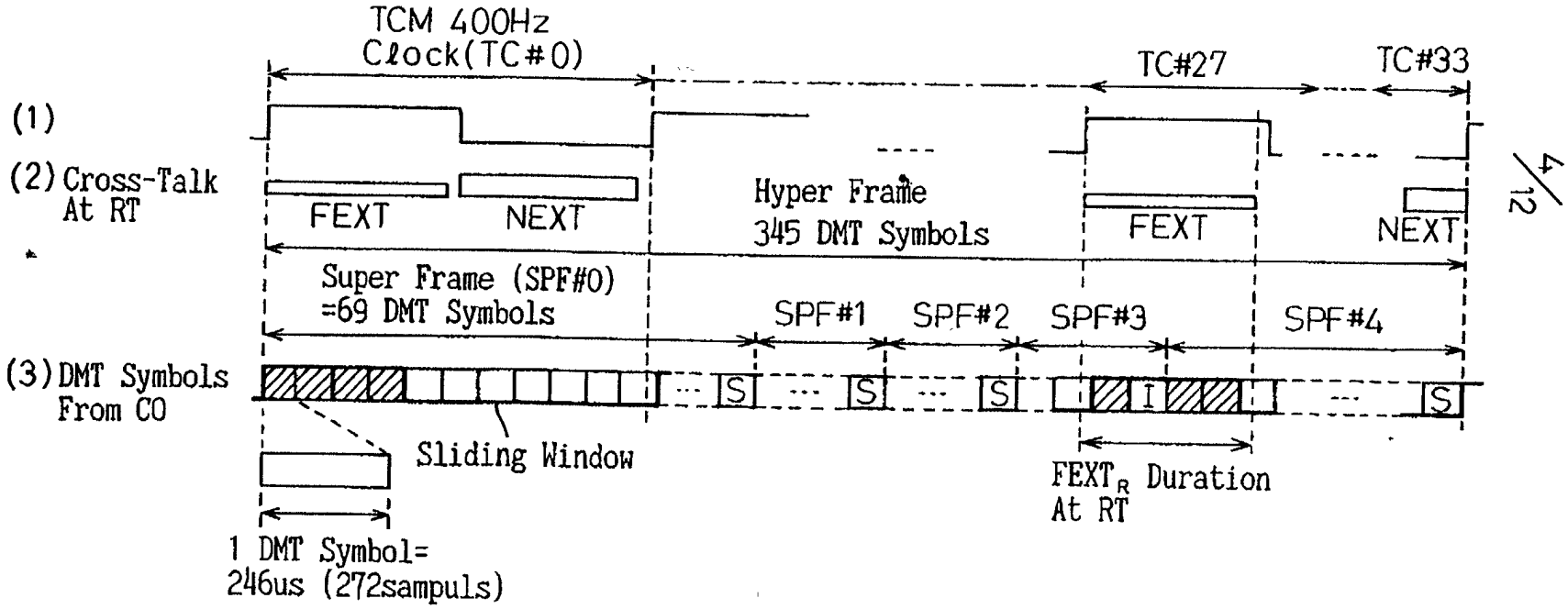
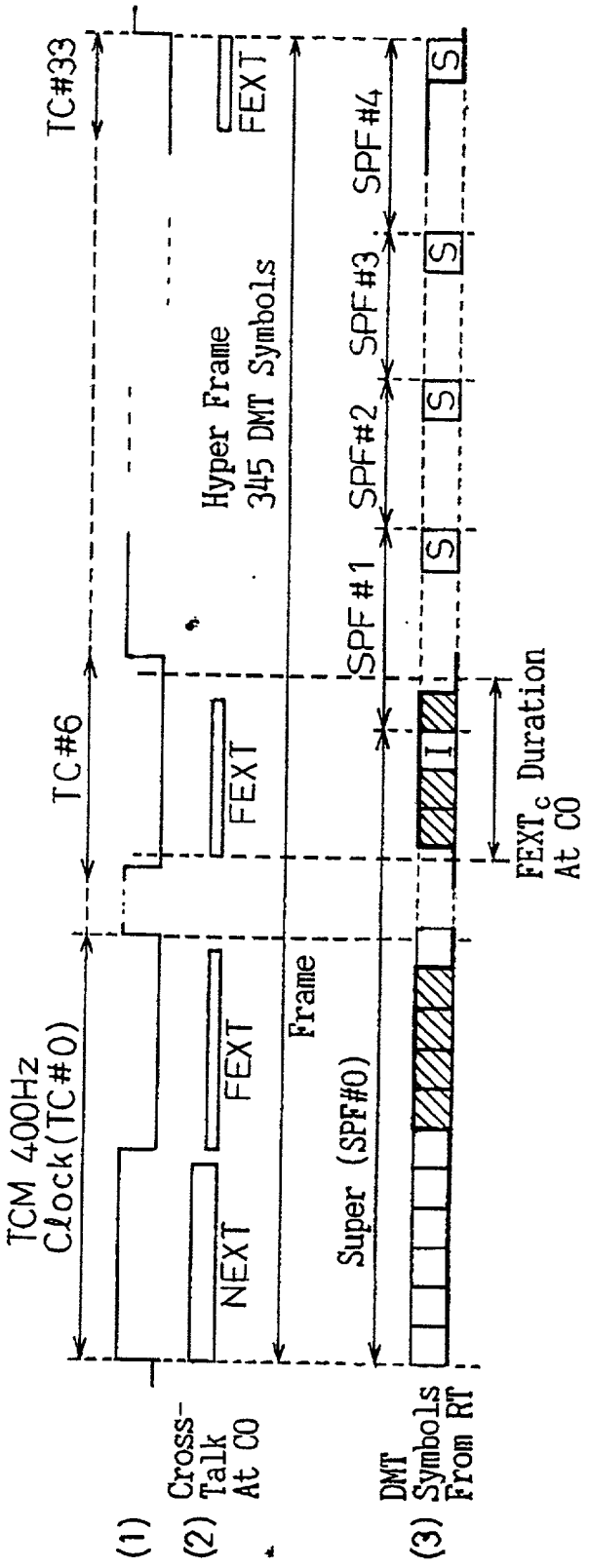

TCM 400Hz
Clock(TC#0)
TC#27
TC#33
(1)
(2) Cross-Talk
At RT
FEXT
NEXT
Hyper Frame
345 DMT Symbols
FEXT
NEXT
Super Frame (SPF#0)
=69 DMT Symbols
SPF#1
SPF#2
SPF#3
SPF#4
(3) DMT Symbols
From CO
S
I
Sliding Window
FEXT$_R$ Duration
At RT
1 DMT Symbol=
246us (272sampuls)

Fig. 4


TC#33
TC#6
TCM 400Hz
Clock(TC#0)
(1)
(2) Cross-
Talk
At CO
NEXT
FEXT
FEXT
Hyper Frame
345 DMT Symbols
Frame
Super (SPF#0)
SPF #1
SPF#2
SPF#3
SPF#4
S
S
S
S
I
(3) DMT
Symbols
From RT
FEXT$_c$ Duration
At CO

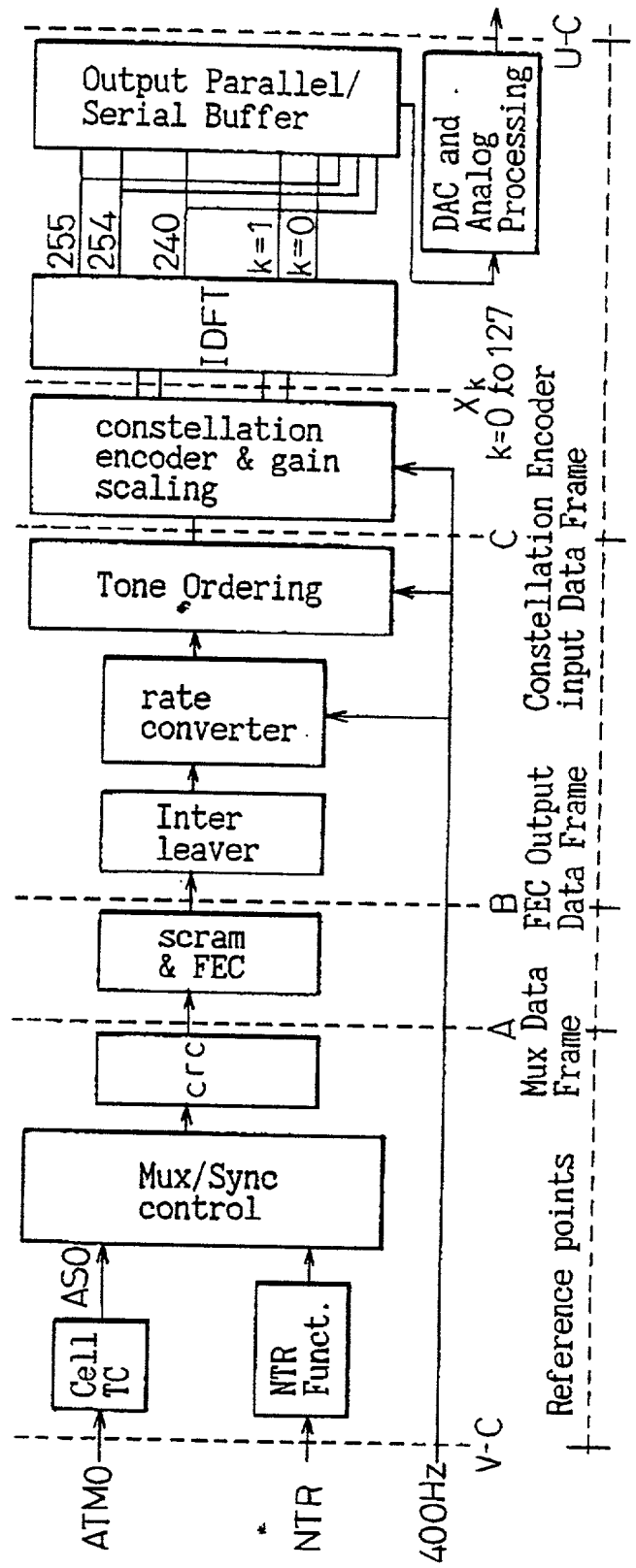

Output Parallel/ Serial Buffer
DAC and Analog Processing
U-C
255
254
240
k=1
k=0
IDFT
X_k k=0 to 127
constellation encoder & gain scaling
C
Constellation Encoder input Data Frame
Tone Ordering
rate converter
Inter leaver
B
FEC Output Data Frame
scram & FEC
A
Mux Data Frame
crc
Mux/Sync control
AS0
Cell TC
NTR Funct.
Reference points
V-C
ATM0
NTR
400Hz

Fig. 5

Fig.6A
PRIOR ART

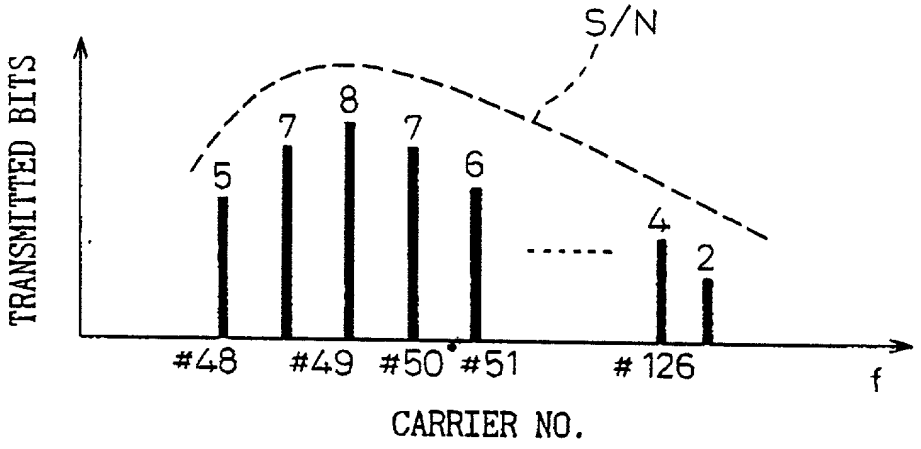


Fig.6B
PRIOR ART

CARRIER NO.i	NUMBER OF TRANSMITTED BITS bi
0	0
⋮	⋮
48	5
49	7
⋮	⋮

Fig.7

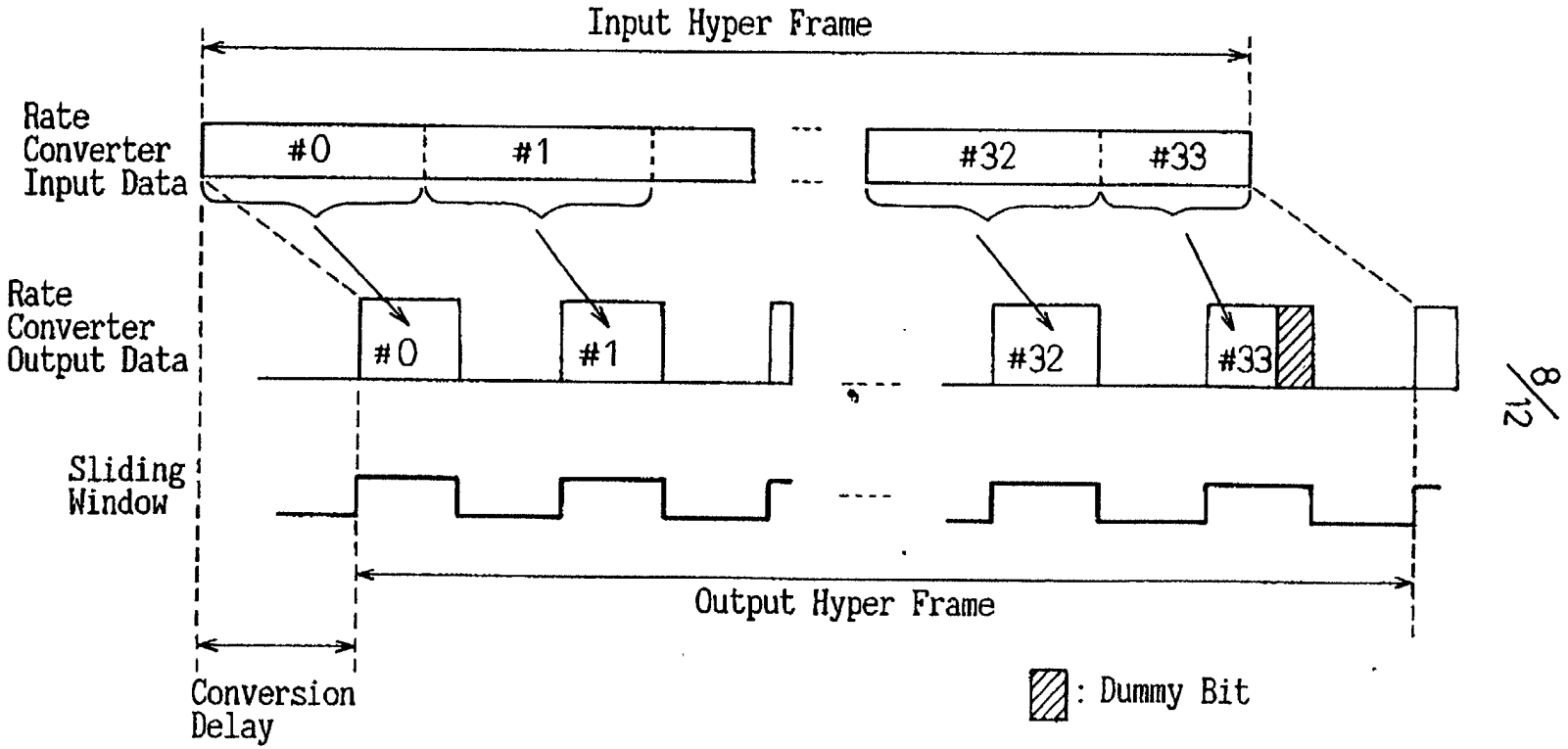

Input Hyper Frame
Rate Converter Input Data
#0
#1
#32
#33
Rate Converter Output Data
#0
#1
#32
#33
Sliding Window
Output Hyper Frame
Conversion Delay
: Dummy Bit

Fig.8A

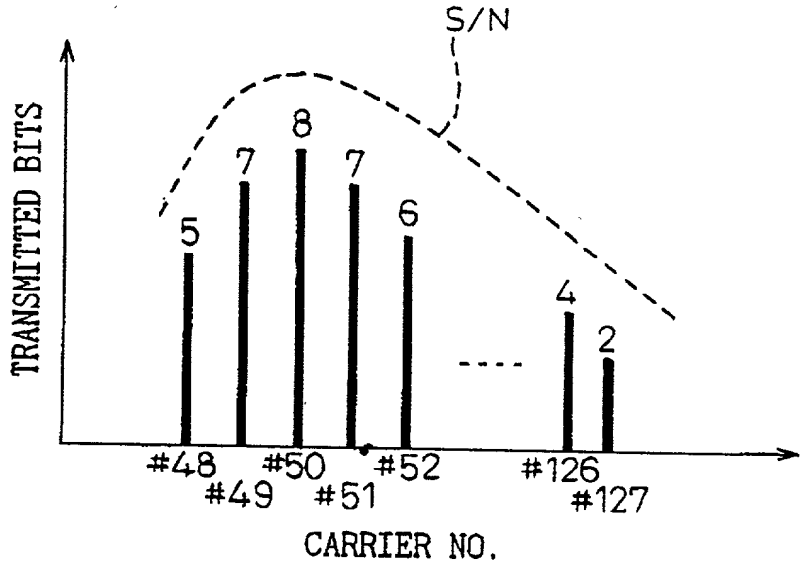


Fig.8B

BITMAP

CARRIER NO.	NUMBER OF TRANSMISSIBLE BITS	S/N MARGIN (dB)	NUMBER OF TRANSMISSION BITS bi
⋮	⋮	⋮	⋮
48	5	7.8	5
49	7	6.5 *	6
50	8	7.4 *	7
51	7	6.1 *	6
52	6	9.4	6
⋮	⋮	⋮	⋮
126	4	6.5 *	3
127	2	8.0	2

*: CARRIER WITH SMALL S/N MARGIN

Fig.9

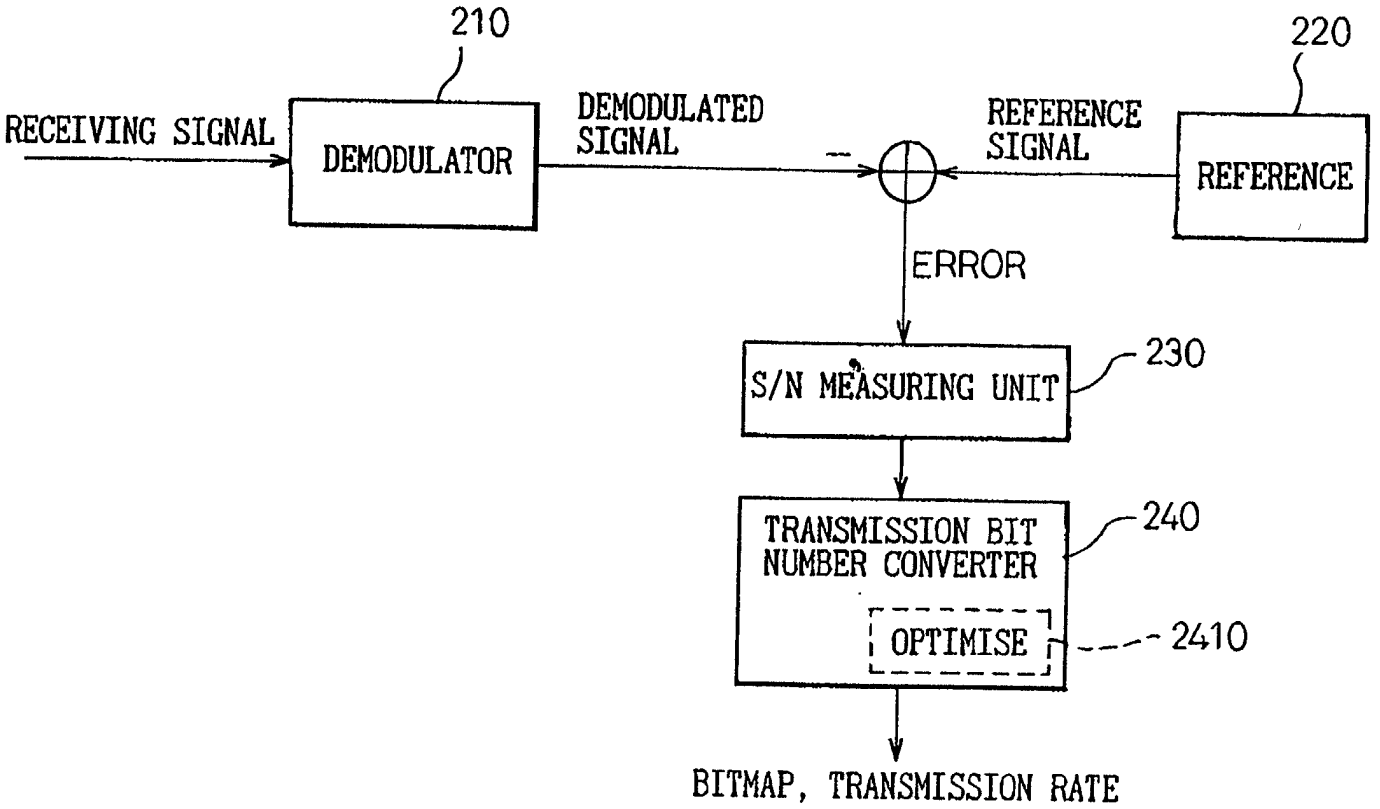

210
220
RECEIVING SIGNAL
DEMODULATOR
DEMODULATED SIGNAL
REFERENCE SIGNAL
REFERENCE
ERROR
S/N MEASURING UNIT
230
TRANSMISSION BIT NUMBER CONVERTER
240
OPTIMISE
2410
BITMAP, TRANSMISSION RATE

Fig.10

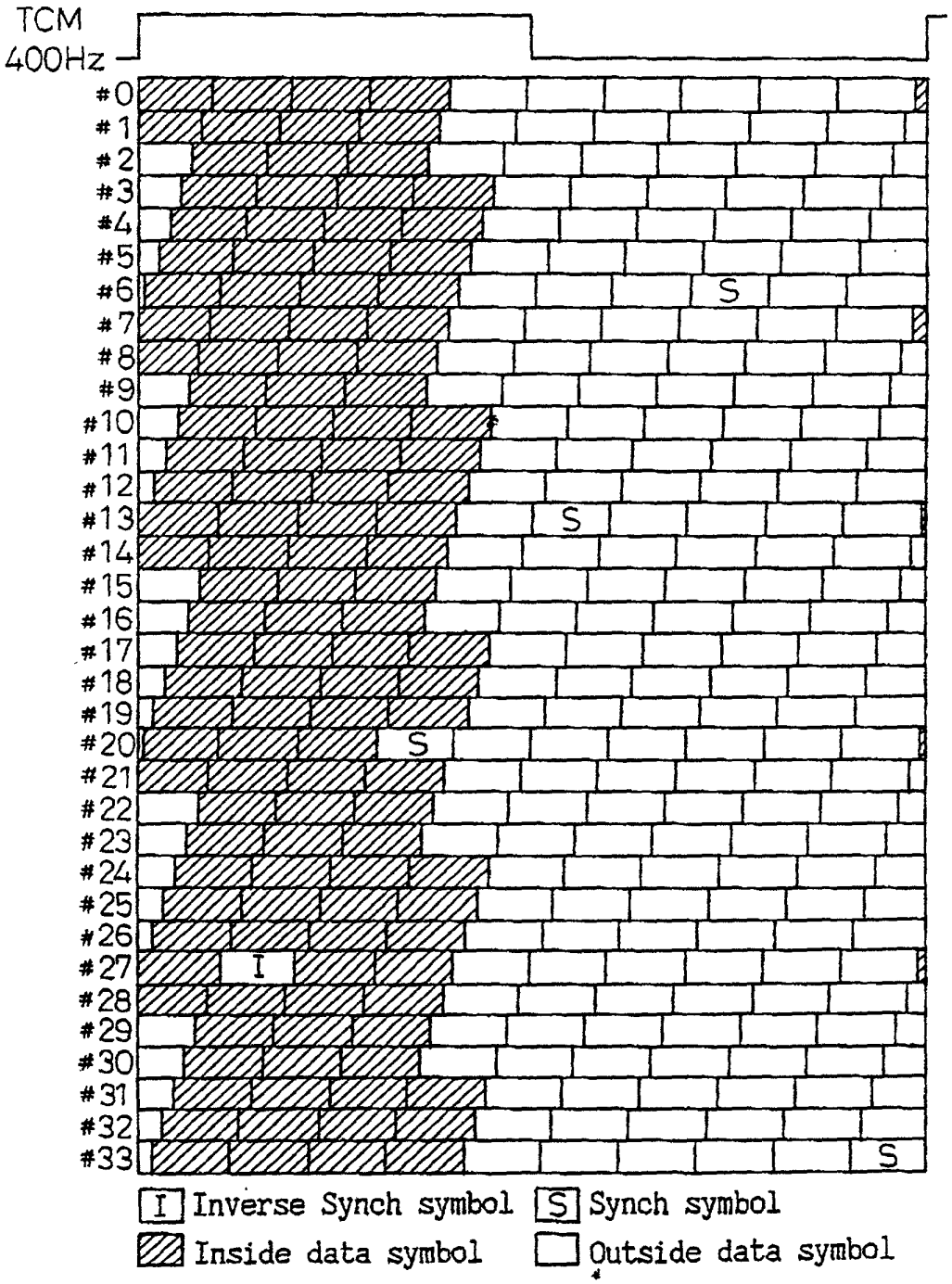


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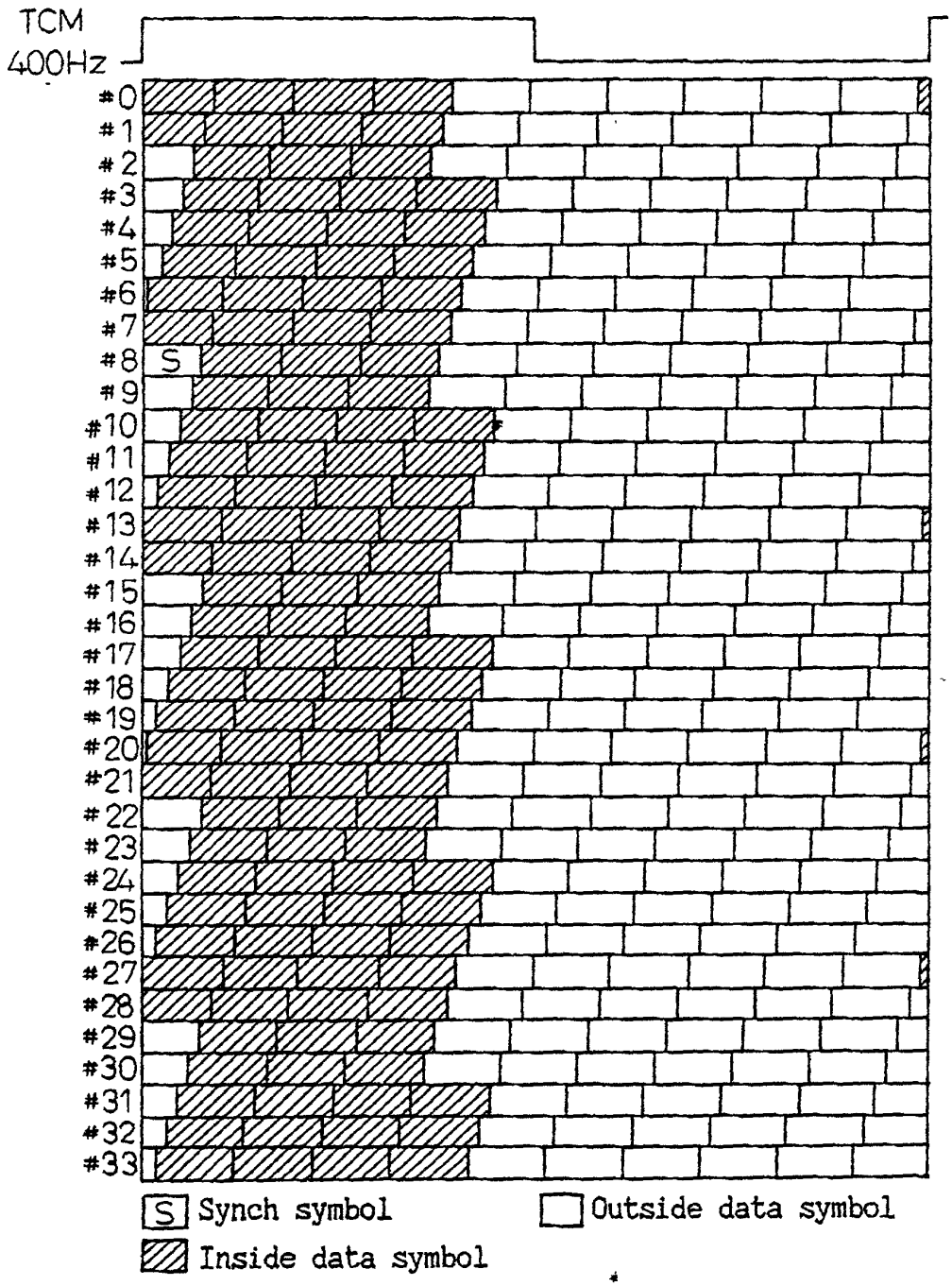
Fig.11



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